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THE EXTENSION POULTRY HUSBANDMAN

Issued by the Bureau of Animal Industry and the
Division of Cooperative Extension, Cooperating,
H. L. Shrader, Senior Extension Poultry Husbandman.

Serial Number 5 --

May, 1935

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THE SEARCH FOR SUPERIOR BREEDING STOCK

By

Hugh C. McPhee,

Chief, Animal Husbandry Division.

Quite recently a cooperative survey on poultry breeding was undertaken by the United States Department of Agriculture and the State experiment stations. At the suggestion of Secretary Wallace questionnaires were first sent to the directors of the experiment stations asking for certain information concerning the methods of breeding practiced and results secured in breeding for egg production and in breeding turkeys at the experiment stations. Station directors were also asked to submit the names and addresses of private breeders regarded as having strains of superior breeding worth. Questionnaires are being sent to these private breeders as well as to public institutions and private breeders in foreign countries.

Secretary Wallace is very much interested in securing as much information as possible concerning possible sources of superior germ plasm with a view toward its utilization in the development of more efficient laying strains of chickens and more efficient meat-producing strains of turkeys.

Judging by the returns secured from the questionnaire sent to the experiment stations very few of them have flocks of outstanding merit. It is most unfortunate that lack of finances at many of the stations makes it impossible to maintain a breeding flock of sufficient size to provide for the adequate selection of breeding stock. At a few of the stations breeding work is carried on with three or four different breeds or varieties instead of concentrating efforts on one breed or variety. At some of the stations some of the breeding stock and some of the progeny are used in nutrition experiments. At most of the stations some culling of the pullet progeny is carried on, a practice which lessens materially the value of the results secured. At many stations the progeny-test method of selecting breeding stock is not employed. At most stations it would appear that too much reliance is placed upon phenotypic methods of selecting prospective sires and dams.

For these and other reasons it is not surprising that with many of the experiment-station flocks the identification of sires and dams of outstanding merit seems out of the question. On the other hand, two or three experiment station flocks are of unusual merit and the analysis of the records of quite a number of private flocks in the United States and in some foreign countries is expected to reveal information of considerable value. Not only is it important to be able to identify males and females of superior breeding worth but what is more to the point is the possibility of determining methods of selection and breeding which will produce progeny of outstanding merit. In the first analysis the cooperative survey should serve to identify the poultry breeders who are doing the best work in developing efficient strains. It is anticipated that the results of the survey will eventually prove to be of considerable value to the poultry breeding industry of the United State.

THE POULTRY SPECIALIST AND THE HATCHERY CODE

By

Berley Winton,

Extension Poultryman, Missouri College of Agriculture.

For years the poultry extension specialist has sought to bring about the use of certain practices on the part of hatcherymen which would improve the quality of chicks and other hatchery products. These efforts have met with a small degree of success but it was brought about primarily by educating prospective purchasers that considerable discrimination should be made in buying hatchery products. Recalcitrant hatcherymen without a due regard for the financial welfare of their competitors and their customers gave rise to the need and the development of the hatchery code.

As soon as national legislation was passed by Congress, making it possible for an industry to formulate a code of fair competition, the leadership of the hatchery industry grasped the opportunity and shouldered the responsibility which was peculiarly their own to place this business on a more permanent and ethical basis. In formulating the code there was apparently a general recognition of the fact that the interests of ethical hatcherymen and farmers are mutual.

Quite a number of poultry specialists played an important role last year in making the hatchery code a success. The provisions of the code were discussed at meetings with both farmers and hatcherymen. Publicity material was prepared and disseminated through the press. Other phases of the Triple A program were under way last year and demanded the services of many poultry specialists. Although these specialists invariably gave a good account of themselves in this other work, it was indeed unfortunate for the poultry industry that these men could not devote their attention to the welfare of the poultry industry by carrying on an educational campaign on the provisions of the hatchery code. This is especially true since the code was likewise sponsored by the Agricultural Adjustment Administration.

The effectiveness of the hatchery code rests primarily and ultimately upon farmers becoming familiar with its provisions. Hatcherymen are in a position to help directly with this educational work but their primary business is that of producing and selling hatchery products. The responsibility for carrying on the educational work should be recognized and done by the Agricultural Extension Service. This affords a rare opportunity, in my opinion, for poultry specialists to be of service to chick buyers, producers of hatching eggs, and legitimate hatcherymen.

For years we have been encouraging farmers to patronize those hatcherymen who have under way a constructive breeding program, a worthwhile program for the control of pullorum disease and who honestly advertise their products and do business on an ethical basis. The hatchery code and the Federal Trade Commission rules make our efforts more effective in this field. The provisions of the hatchery code make it possible for farmers to get more nearly what they buy than heretofore. They likewise make it more difficult for dishonest hatcherymen to operate.

The interests of the entire poultry industry cannot be served most efficiently at this time unless the administrative authorities of the Extension Service in the various States release the services of the poultry specialists to work in their regular field. This is especially important since most county agents will be expected to devote their time this spring to other phases of the Triple-A program. Although county agents may be able to hold but few poultry meetings this spring, they should be familiar with the general provisions of the hatchery code so that they may pass along the information in making personal contacts with farmers. It is the responsibility of the poultry specialist to place an official copy of the Hatchery Code into the hands of each county agent and to prepare publicity for him to release.

A provision in the 1934 hatchery code called for the development of a national uniform plan of flock improvement and pullorum-disease control. The proposed plan has been submitted and is expected to go into operation on July 1, 1935. In most States the poultry interests will have to be merged and an organization developed through which the State and Federal agencies can work effectively in the administration of the National plan. The possibilities of the national plan are so great and the effects of it are so far reaching that specialists are apparently justified during the next few months in spending as much time as is necessary for the development of the proper State organization.

A British Chick Sexing Association has been organized and has announced it expects to hold examinations awarding first, second, and third class diplomas. The diplomas are graduated according to the proficiency of the applicant in accuracy and speed, the scale selected being 95, 90, and 85 percent accuracy with 500, 300, and 200 chicks handled per hour for the first, second, and third class respectively. The first examination, as reported by R. M. Forsyth in the "Feathered World," was taken by 16 contestants, 11 of whom won third class diplomas, the remainder not qualifying.

TRAINING 4-H POULTRY CLUB JUDGING TEAMS

By

H. G. Ware, Extension Poultryman,
Oklahoma A. & M. College

Poultry judging schools, State and out-of State trips, and national contests, have attracted the attention of a large number of 4-H poultry club boys and girls in many states during the past few years. Trips awarded for outstanding work done in the club program have been valuable in stimulating interest, and keeping up a progressive spirit among the club members.

Facts learned by the young poultry enthusiast while passing through the ranks as an amateur judge or poultry grower usually prove worthwhile in developing the young club member, and inspiring him to carry on.

In Oklahoma, 4-H poultry work begins with the selection from the home flock or purchase of 50 or more purebred baby chicks that are to be fed and managed by the club member. The second year 75 chicks are recommended and 125 or more for each year thereafter. A club record shows the amount and cost of feed consumed, equipment used, eggs and poultry sold, and amount received from them. It is desirable for junior judges to have practical experience in producing, feeding, and managing a flock. The foundation for learning to judge is largely acquired from practical poultry experience.

The first training in poultry judging is begun in the community. Two general plans are followed. First: A number of birds, representing the various breeds are brought in to a designated place by the owners, for practice judging. Second: A pair of standard wire coops are placed on an automobile, and the coach and the young judges go from farm to farm where the common breeds of chickens are raised, and a day is spent in handling and studying the birds. The young judges are taught the correct way to remove the birds from the coops, how to hold them, and the proper way to return them to the coops. A detailed study is made with reference to shape, color, size, quality, and standard disqualifications. In production judging, all the factors affecting egg-production are taught and demonstrations are given using a number of birds that show the different qualifications according to number of eggs laid. Trapnested birds are usually used for this work. The training courses include exhibition and production judging with oral reasons, live and dressed market poultry, and market eggs. Aside from the farm trips where exhibition and production judging is done, trips are made to the packing houses for special training in market products.

In the training course, oral reasons are taught. It has been my experience that boys or girls never learn to judge very efficiently until they learn to analyze the birds and are able to give a logical set of reasons, showing the difference between the various pairs. "Tailor-made" reasons are never used, because no two pairs of birds are exactly alike.

The members learn from experience more about the feeding and management of the flock and the methods to use in selecting the birds for the shows and for production. At the community shows and the county fairs, small cash prizes are usually offered on exhibits and in judging. This creates interest among the group to work toward stronger competition in the larger fairs and shows.

A close check is kept on the better judges at each school or contest for a number of years. The boy or girl who has been consistently good in his selection of birds for exhibits, ranks near the top in strong competition in all phases of judging and has a good flock which shows quality and is well managed, is in line for consideration for an out-of-State trip. Boys or girls, 17 or 18 years of age, who have had from 5 to 8 years of practical poultry experience in the selection of birds for shows, understand culling, feeding, and management, and who have been up against stiff competition, usually make the better judges for big contests..

"We feel that we have saved the hatcherymen in the State a considerable amount of money by conducting chick-sexing demonstrations during our short course, this assumption being based on the fact that commercial sexing schools at that time were charging a fee of \$75 to \$100 for each person attending the school. Not only was the attendance at the short course the largest that we have experienced in several years, but approximately 75 hatcherymen and licensed culling inspectors attended every chick-sexing demonstration held during the week. Following the school many of them expressed confidence in themselves that they could with additional practice go home and do sexing work with a high degree of accuracy."

From recent letter from J. E. Humphrey, Field Agent
in Poultry, (University of Kentucky chick-sexing schools.)

BREEDING FOR HEALTHIER POULTRY

(From Monthly Poultry Suggestions, December, 1934, University of Illinois)

At the University of Illinois Dr. E. Roberts, Associate Professor of Animal Genetics, and Dr. L. E. Gard, Professor of Poultry Husbandry, have made the following significant observations in connection with their research work on the resistance and susceptibility of poultry to pullorum disease.

"There was a consistent difference in survival, after exposure to the infecting organism, between chicks from selected and unselected stocks; and consistent performance, during successive years, of individuals selected for resistance on the basis of survival of progeny.

"There was a higher survival among chicks from inbred flocks than among those from noninbred flocks, when both were exposed to the causative organism of the disease.

"There was a higher survival of chicks produced by crossing resistant and unselected stocks, than of chicks from unselected stocks.

"There was a higher survival among chicks produced by backcrossing the F1 generation to resistant stock, than among chicks from a back cross to unselected stock.

"In the second generation of a cross between resistant and unselected stocks it was possible to make effective selection for high and low resistance. The progeny of the high selection showed a survival of 69 percent when exposed to the disease, in contrast to a survival of only 8 percent among the progeny of those selected for susceptibility."

While there may be some difference of opinion by scientists as to the real explanation of this resistance to disease, the important fact for the practical poultryman is that the parent flock can very materially be a factor in the subsequent health of the offspring.

FORCED MOLTING

An attempt was made to molt yearlings in June and July and get them back in production during the high-price period. From attempts made last year this procedure seemed to be undesirable. The work for this year has gone forward entirely on the basis of maintaining as high egg production as possible from these demonstration flocks by preventing the molt as long as possible.

H. L. Richardson-1934 Maine Annual Report.

The practice of forcing birds into molt in order to secure eggs at the time of year when prices are high is being tried out in several sections of the United States. In the King County, Washington, 1934 Annual Report, Mr. Clarence A. Svinth, Assistant County Agent in charge of poultry, reports data gathered from 12 farms. Space does not permit reproduction of the entire table, however, the story of a typical farm is given.

The record covers three distinct periods - Molting Period, Resting Period, and Laying Period.

Flock No. 10 inventoried 480 birds, with a production of 307 eggs, July 15. The flock was then thrown into a molt by eliminating all mash, restricting the water, and giving only a limited amount of grain. By August 1 the daily production had been reduced to 28 eggs, and many of the birds were reported in full molt.

The following 6 weeks constituted the resting period when the birds were given range on succulent green food, plenty of water, a light feeding of bran and cod-liver oil and a liberal feeding of grain. The egg production of this flock had started upward by August 10 and at the end of the resting period had reached 182 eggs per day.

For the laying period the birds were confined to the house and sun porch, and put on full feed with mash, grain, greens and all-night lights. This flock reached its highest daily production, in this period, on October 5 when 266 eggs were produced. Nine birds were culled from the flock and 6 birds died.

The feed cost for the flock during the first 6 weeks of this treatment was \$59.20. The total feed cost for the period of the report was \$462.60 with egg receipts for the same period of \$782.80, which left a net over feed cost of \$320.20.

The effect of forced molting on the size of eggs was studied since all eggs were sold on a graded basis. Previous to the molt 48 percent of all eggs graded as Extras, the third month after the molt 64 percent made this grade.

A copy of the instructions furnished to cooperators by the county agent is given on the next page.

FORCED MOLTING
Instructions to Cooperators

- a. Start molt between July 1 to July 15.
- b. Do not molt birds that were hatched after April 1st.
- c. Cull out all thin flesh and sick birds.
- d. Be ready to use all-night lights.
- e. Examine birds and treat, if necessary, for lice and worms.

Molting Period -- till egg production ceases and feathers drop.

- a. Confine birds to very roomy house or to normal house and sun porch.
- b. Remove all mash.
- c. Take water from birds for 24 hours the first day and then for 12 hours on alternate days till production takes a drastic drop. When watering, give 10 feet of drinking space to each 100 birds.
- d. Feed grain sparingly, about 6 pounds a day, per 100 birds, in 3 equal feeds for the first 5 days, then 8 to 9 pounds daily throughout this period. Feed grain in deep, dry litter.
- e. Give green feed, but only what birds will clean up in 30 minutes.
- f. Feed no milk, use no lights.
- g. Keep hard granite grit in hoppers.

The grain fed during this and the next period may be about 1/2 whole oats (heavy grade).

Resting Period -- After feathers have dropped till end of 6th week.

- a. Let birds out on clean range and give all the green feed they will eat.
- b. Feed 3 pounds wheat bran or mill run daily per 100 birds. Be sure that all birds have a chance to eat at once.
- c. Mix equivalent of 1 quart cod-liver oil in each 100 pounds of bran or mill run.
- d. Continue 3 feeds of grain daily, just enough to maintain weight.
- e. Feed no milk, but keep clean fresh water before birds at all times.
- f. Keep hard granite grit and shell in hoppers.
- g. Use no lights.

Laying Period -- Seventh week till end of profitable production

- a. Confine birds to laying house and sun porch.
- b. Use all-night lights. Have one 10-watt lamp, hung directly over mash hopper, for each 100 birds.
- c. Keep Washington laying mash in hoppers. Have 20 feet of eating space per 100 birds. Use a mash with some vitamin D concentrate in it.
- d. Feed grain once a day only, about 3:30 P. M. Limit grain to 7 to 9 pounds per 100 birds, depending on appetite and weight of birds.
- e. Keep birds active by feeding grain in deep, clean litter.
- f. Provide 10 feet of drinking space per 100 birds.
- g. Feed fresh green feed, in addition to the greens in the mash-- what the birds will clean up in one hour at noon; or feed 4 pounds of crisp yellow carrots daily per 100 birds.
- h. Keep hard granite grit in hoppers.
- i. Have 20 to 25 nests for each 100 birds.
- j. Cull birds that drop out of production each month to keep production above 50 percent.

(King County, Washington, 1934 County Agent's Annual Report)

SUMMARY OF REPORTS ON DEMONSTRATION FARM FLOCKS
(As furnished by 17 States)

November 1, 1932 - October 31, 1933

State	Farms	Average size of flock	Eggs per hen	Mortal- ity	Feed cost per hen	Total income per hen	Feed cost per doz. eggs	Selling price per doz. eggs
	Number	Number	Number	Percent	Dollars	Dollars	Cents	Cents
Calif.**	126	956	133	38.9	2.37***	1.98	---	17.4
Conn.*	208	359	162	15.8(P) 13.2(H)	---	---	---	---
Del.	114	493	120	21.9(P) 19.5(H)	1.03	3.55	26.0	21.0
Fla.	51	259	169	15.7	---	---	---	---
Ill.	20	510	131	20.9	.60	---	13***	15.3
Ind.*	106	264	138	19.0	.72	1.75	6.2	15.2
Iowa	50	223	134	19.0	.97	---	8.2	10.7
Ky.	147	108	147	---	1.47***	2.73	---	---
Maine	113	---	159	---	---	---	---	---
Mass.	26	---	146	19.0	2.27	4.97	---	29.6
Md.	73	265	146	24.1(P) 16.1(H)	---	---	---	---
Mo.	363	162	143	---	.74	1.72	8.0	14.0
	42	579	150	---	.80	1.70	8.0	15.0
Mont.	26	126	146	17.0	.95	---	8.0	18.0
Nebr.	33	231	135	17.0	.90	2.33	---	13.7
N. H.	195	---	162	15.0	---	---	---	---
Pa.	64	359	156	19.2	1.21	3.35	19.0***	21.6
Utah	198	646	147	26.7	---	---	---	---

*October 1 to September 30.

**San Bernardino County.

***Total cost.

Note - P and H denote pullets and hens.

SUMMARY OF REPORTS ON DEMONSTRATION FARM FLOCKS
(As furnished by 20 States)

November 1, 1933 - October 31, 1934

State	Farms	Average size of flock	Eggs per hen	Mortal- ity	Feed cost per hen	Total income per hen	Feed cost per doz. eggs	Selling price per doz. eggs
	Number	Number	Number	Percent	Dollars	Dollars	Cents	Cents
Ark.	14	158	176	---	1.34	---	9.19	17.75
Conn.*	114	410	162	15.0(P) 11.0(H)	---	---	---	---
Fla.*	43	354	181	12.26	---	---	---	---
Ind.**	122	261	140	18.0	1.01	---	8.70	17.50
Iowa	41	243	135	21.0	.91	2.06	---	---
Kans.*	387	183	152	---	---	---	---	---
Maine	138	206	157	---	3.18	---	---	---
Md.	107	282	147	21.0	---	---	---	---
Mich.	90	249	155	20.0	1.25	---	9.70	18.60
Minn.	63	238	155	----	---	---	---	---
Mo.	210	158	139	----	1.03	1.98	11.00	16.00
	44	554	140	----	1.02	1.83	10.00	16.00
Mont.	42	170	166	16.0	1.20	---	8.90	19.00
Nebr.	14	224	122	----	---	2.27	---	13.50
N. H.*	256	522	164	14.15	---	---	---	---
N. C.	109	173	159	----	1.59	3.01	---	24.00
Ohio*	142	285	145	20.2	1.24**	3.06	10.5	19.80
Okla.	131	148	135	----	.94	---	10.0	---
R. I.*	45	174	168	6.9	---	---	11.5	---
Va.	---	---	151	---	---	---	---	---
Wis.	---	211	144	20.76	---	---	8.57	23.5

*October 1 to September 30.

**Cost of raising young stock not included.

Note - P and H denote pullets and hens.

SEXING EGGS

In the December 14, 1934 issue of "Poultry", an English poultry journal, we find an article by A. G. Allen entitled, "A Big Step Forward - The Sexing of Eggs." Mr. Allen advances his theory that by pedigreed hatching he can establish the fixed sex cycle of the bird then once this has been determined, eliminate the eggs of the sex not wanted. This article makes very good reading as far as theory is concerned, but a study of pedigreed hatching where eggs are dated and the sex of individual chicks recorded brings us to the conclusion that there is no fixed cycle for sex. Data collected by Mr. Burt Heywang at the Glendale, Arizona Station, U. S. Department of Agriculture, gives information from a number of birds. One very upsetting factor in examining these data is the appearance of infertile eggs. However, the eggs of certain of the hens proved remarkably good hatching and give us considerable data to study in connection with Mr. Allen's theory. A large number of hens were studied and the records of two are cited as being typical examples.

Hen No. 1405 laid 11 eggs between the 2nd and 17th of the month, all of which hatched. Of these 7 were females and 4 males, the sexes appearing in the following order: The first egg, female, then 2 males; 2 females; 1 male; 2 females; 1 male; 2 females. It looked as though this hen had settled down to produce 2 females followed by 1 male. However, between the 17th and 23rd of the month she produced 3 eggs which did not hatch, one being infertile and 2 embryos dead in the shell. On the 23rd of the month she produced an egg that hatched a male chick. In the case of the next egg unfortunately the chick died in the shell before the sex could be determined. The next egg was a male followed by 1 female, 2 males and 1 female. In other words, after settling down to a cycle it looks as though she had reversed herself and was producing 2 males for each female chick. Of the total 21 eggs produced between the 2nd of one month to the 4th of the next, 9 were females, 8 were males and 4 were infertile or the embryos died in the shell.

Hen No. 1407 was observed over a longer period of time and gave 16 females, 7 males and 8 eggs infertile or with embryos dead in the shell. A typical illustration of her cycle runs like this 2 males; 3 females; 1 male; 1 female; 1 male; 1 infertile; 1 male; 4 females. Another period of her record which is not upset by infertile or dead in the shell eggs reads as follows: 4 females; 2 males; 3 females; 1 male; 1 female; 2 males; 5 females; 1 male; 1 female; 1 male; 4 females; 3 males; 1 female; 1 male; 1 female. It can readily be seen that no typical sex cycle is present and hence Mr. Allen's theory is not substantiated by actual hen performance.

COMPARISON OF METHODS OF FEEDING - 12 MONTHS' SUMMARY (1933-34)
(Including only flocks reporting same feeding system
entire year)

Method	Total farms	Av. no. birds	Eggs per bird	% Flock decrease	% birds culled	% total mortality
Mash in hoppers, grain in litter	57	18,737	164.7	56.43	43.31	13.12
Mash in hoppers, grain in hoppers	22	7,984	159.9	48.78	33.32	15.46
All mash, no other feed	7	4,044	140.9	57.70	43.54	14.16

Connecticut Home Egg-Laying Contest
Bulletin, October, 1934.

* * * * *

Someone has seen fit to call the following rations "Brain Trust Formulas" They were revised October 5, 1934, by the New England College Feed Conference Board.

Ingredients	Chick mash (lbs.)	Laying mash (lbs.)
Coarse yellow corn meal,	200	200
Wheat bran,	100	100
Wheat flour middlings,	100	100
Ground oats or oat groats,	100	100
Meat scrap--not less than 50% protein,	50	50
Dried skimmed milk or dried buttermilk,	50	25
Fish meal--not less than 50% protein,	25	25
Alfalfa leaf meal--not more than 20% fiber,	25	25
Calcium carbonate (ground oyster shells or ground limestone--not less than 96% calcium carbonate),	15	15
Common salt,	5	5
	670	645
Tested cod liver oil, or sardine oil of high biological rating,	3½ (qts.)	3½ (qts.)
	Chick grain (lbs.)	Hen grain (lbs.)
Yellow corn (fine cracked for chicks whole or cracked for hens),	200	200
Wheat (cracked for chicks- whole or cracked for hens),	100	100
Barley and oats up to 100 pounds may be added to the hen ration.		

BRICK BROODERS

Some day an interesting story on the developments in brooding chicks will be written. The methods of heating the brooder house for baby chicks, particularly in the Southern States, have undergone radical changes in the last few years. In February, 1926, the State College of Washington, through the county extension agent of Whatcom County, H. B. Carroll, Jr., issued a bulletin on the Dutch oven or cement brooder stove. Years before this the writer remembers visiting a successful poultryman in the Ozarks of Missouri, who built a brooder house with a cement floor which had a hump in the center. This hump was utilized as a fire box in which old fence rails were burned, thus furnishing the heat for brooding baby chicks. Curiously enough this man had trouble with leg weakness, in his chickens, and since his attempt at brooding was carried on before cod-liver oil was generally recommended, undoubtedly this lack of knowledge concerning the nutrition prevented his system from developing. In those days under-floor heat was supposed to be a cause of leg weakness.

The furnace or tunnel type of brooder has been in use in the Western and Northwestern States for a considerable period of years. Idaho has a publication, Extension Bulletin 63, which touches on this subject. One of the earliest publications on brick brooders came from Alabama, which was adapted from the Washington Dutch oven type. The Mississippi specialists used their ingenuity and built a brick brooder around a discarded oil drum. So popular was this bulletin that the first issue of 10,000 copies was quickly exhausted. Kentucky investigators used an adaptation of this by setting a small oil drum inside a large container and tamping the space between the two with moist clay. This furnishes a fire box that holds the heat in admirable fashion. The Virginia station has recently issued a publication which shows a brick fire box with wings or a hover on either side. The top of this brooder is covered with sand, which when kept moist helps maintain a higher humidity in the room. In a South Carolina report we find mention of home-made brooders using clay and stone. In North Carolina an ingenious arrangement was developed whereby two oil drums are filled with water and placed approximately 20 feet on each side of the brick fire box. With a pipe circulating water to the central fire box it is possible to brood 3 lots of chicks with one fire. Georgia investigators built a brick brooder and carried on a fuel-cost study.

Possibly this type of brooder can be blamed on the depression, but undoubtedly it has had a great effect on the brooding of chicks in the Southern States. It is little wonder then that the hatchery report for March, 1935, shows an increase of salable chicks hatched of 51 percent in the South Atlantic and 26 percent in the South Central States. Both sections show a 39 percent increase in bookings for later delivery.

No accurate estimate can be given for the total number of these brooders that have been constructed. One State mentions 2,000 in one year. They are practical, of course, only where wood is accessible and reasonable in price.

The most frequent warnings in using this type of brooder consist in cautioning the operators about keeping the brooder room too warm. This is particularly true in poorly ventilated buildings. Another essential feature is to use green wood, hard wood is preferable, as this gives the slow type of fire that is desired. A damper in the pipe is essential to eliminate too free burning. Another objection to brick brooders is they are not adapted to portable colony houses and they take up a great deal of floor space in the brooder house. The sun porch is frequently used to provide sanitation and more floor space.

Brick brooders may not be popular with the brooder-stove manufacturers but they certainly have fitted into the economic picture of rearing chickens in the South.

PRODUCING QUALITY EGGS

A large number of poultry specialists are placing special emphasis on projects tending toward the production and selection of quality market eggs. Many of them are attacking this from a flock management standpoint, although a great deal of attention is being paid to promptness in cooling. In the May issue of the U. S. Egg and Poultry Magazine, E. M. Funk of Missouri, gives some results of cooling eggs by different methods on farms. Mr. Berley Winton has issued Circular 299, The Missouri Egg Cooler, which explains how to construct an inexpensive cooling room. Two egg inspectors, Kendrick Sauders and Harry Adams, at the Coptesville, Pa. egg auction, have a cooling device, which, equipped with a small motor and fan, blows air into a series of moist filters, then up through a bucket of eggs. The bucket is provided with a screen-wire bottom.

The Connecticut station has stimulated interest by collecting data on the temperature of farm egg rooms. Oregon has Extension Bulletin 445 on the construction of insulated egg storage rooms, and another type of humidifier or egg cooler has been recommended for several years by the California Poultry Department.

With the increase of egg auctions in the East and an increased number of produce houses purchasing eggs on a graded basis in the Middle West, it can be easily seen why a great deal of interest is being stimulated in quality production.

FIRE GUNS

An article on the Disinfection of Poultry Houses by Means of Fire Guns, by H. J. Stafseth and Fernando Camargo, appeared in the February, 1935, issue of the Journal of American Veterinary Medical Association. Four different experiments were carried out on a concrete floor of a large laying house. The floor was carefully swept after removal of the litter, then scraped with a hoe and areas 8 x 8 inches each flamed with a large fire gun of the latest type recommended for this purpose. Sterile cotton swabs were then rubbed over the area and placed in a nutrient broth tube or smeared on brilliant green agar plates. All experiments showed that such organisms as the colon bacillus, staphylococci, streptococci and Salmonella pullorum will survive an exposure to the flame of the fire gun for 10 to 15 second. S. pullorum in artificially infected droppings was recovered after exposures of 2.5, 10, and 15 seconds to the flame. The investigator's conclusion is as follows: "Disinfection of poultry houses by fire is impractical and very inefficient."

THE PROBABLE COST OF RAISING PULLETS IN 1935

This cost is arrived at by applying present prices to average requirements for producing pullets in Massachusetts as is shown by the following:

<u>Required for 1 pullet: (American breed)</u>	
2.5 chicks @ 14¢	\$.35
22 lbs. mash @ \$2.56 per cwt.....	.563
18 lbs. scratch grain @ \$2.27 per cwt.....	.409
1 hour labor @ 25¢ per hour.....	.25
* Other cash costs.....	.180
Overhead costs.....	.200
Total gross cost per pullet	\$ 1.952
Credits: 2 1/2 pound broiler @ 18¢ per lb.	.45
Net cost per pullet	\$ 1.502

*Includes fuel, litter, grit, cod-liver oil, dried milk, and other miscellaneous cash items.

Requirements for raising Leghorn pullets in Massachusetts are not available but it is probable that the cost per pullet will approximate 80 to 85 percent of that for an American breed pullet, or \$1.20 to \$1.25 this season.

Featheredfax, December, 1934.